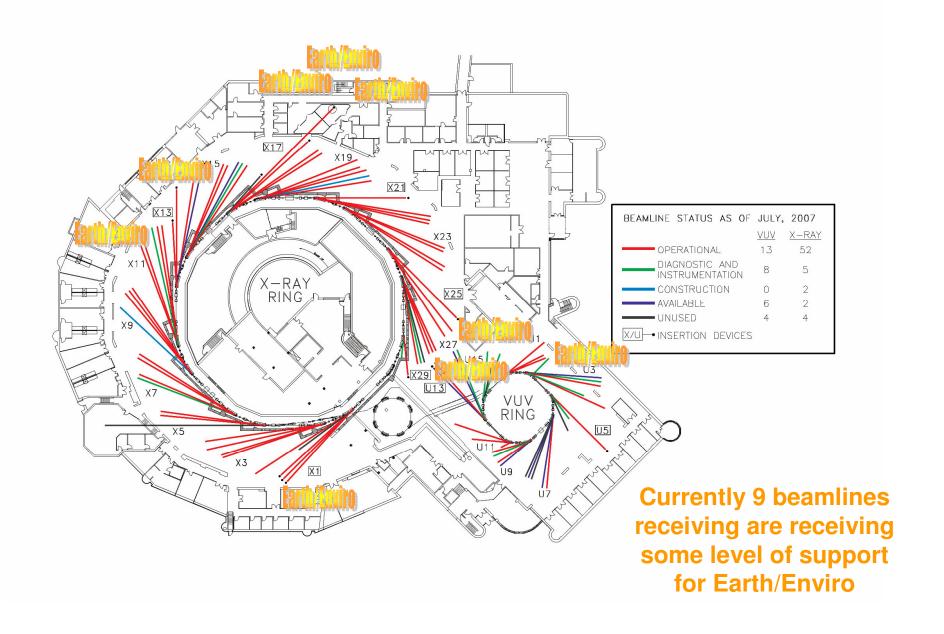
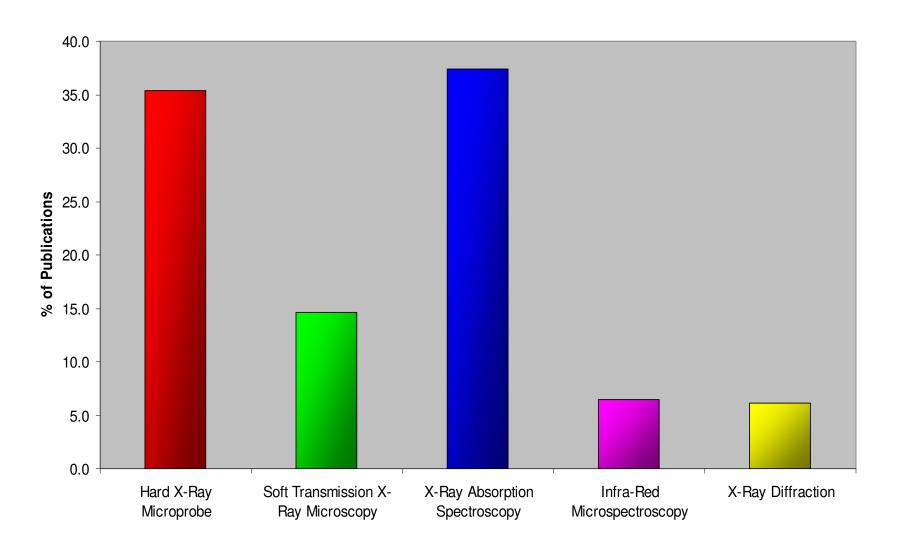
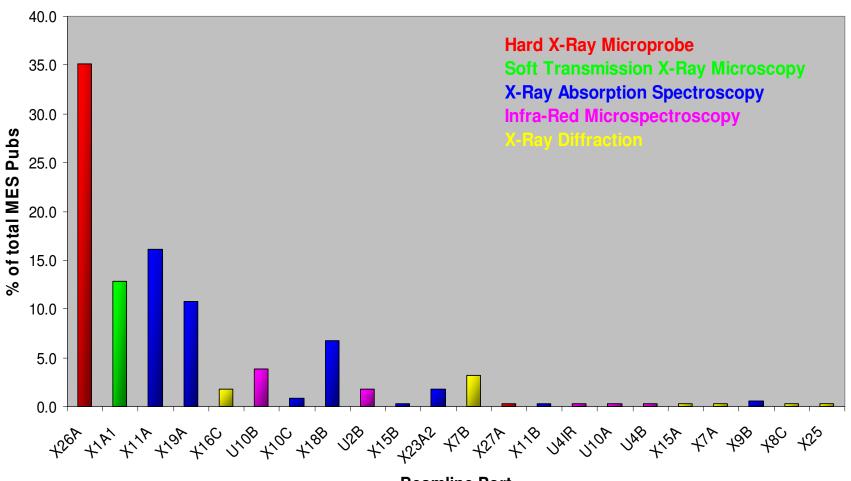
# Earth and Environmental Science Beamlines – Likely Transitions from the NSLS to NSLS-II



### NSLS MES/LTG Publications 1998-2007 % by Technique



## Total Publications for NSLS % of NSLS MES Publications by Beamline 1998-2007



**Beamline Port** 

#### **Hard X-Ray Microprobes**

Beamline: X26A

Managing Agents: U.Chicago/CARS, U.Georgia, BNL Env. Sci.

Energy Range: 4.5 - 30 keV

Techniques: μXRF, μXAS, μXRD, fluorescence CMT

% Subscription: 323%

% GU Time: 25%, 75% MES/LTG through PRT

Equivalent MES: 0.8

Planned Development: 1. Upgrade to 8-element SDD array

2. Upgrade to XIA XMap buffered electronics

3. Upgrade to large area MAR CCD and Image Plate large area

diffractometer systems

Potential Upgrades: 1. Upgrade to Siddons/Ryan detector system

2. Sample stage upgrades for continuous scanning

3. Cryo/Heating - Stage development utilizing Linkam assembly

4. Environmental chamber

Possible NSLS-II Sources: TPW (sub 1µm utilizing current KB technology)

U19 (potentially sub 200 nm)

Crucial for NSLS microprobes to invest efforts in doing Speed studies. It's clear measurements At NSLS-II must be done faster (stages, buffered electronics (XMap). Low T measurements crucial.

#### **Hard X-Ray Microprobes**

Beamline: X27A

Managing Agents: NSLS, CEMS,

BNL Env. Sci.

Energy Range: 4.5 - 40 keVTechniques:  $\mu$ XRF,  $\mu$ XAS

% Subscription: 128%

% GU Time: 50%, 20% MES/LTG through CEMS

Equivalent MES: 0.6

Other MES/LTG Support: CEMS & BNL Env. Sciences/EnviroSuite

Planned Development: 1. Upgrade to XIA XMap electronics

2. Upgrade to μXRD capabilities

3. Upgrade to Siddons/Ryan detector system

Potential Upgrades: 1. Cryo/Heating - Stage development

2. Environmental chamber

Possible NSLS-II Sources: TPW (sub 1µm utilizing current KB technology)

U19 (potentially sub 200 nm)

#### **STXM**

Beamline: X1A

Managing Agents: SUNY SB Physics

Source: Insertion Device

Energy Range: 270-800 eV

Techniques: soft x-ray imaging and µSpectroscopy

% Subscription: 63%

% GU Time: 25%, additional MES/LTG through PRT

Equivalent MES: 0.33

Other MES/LTG Support: CEMS, BNL Env. Sciences/EnviroSuite

Planned Development: An elliptically polarized undulator (EPU) is being

considered to replace existing ID

Potential Upgrades: 1. Develop Xradia-type cryo STXM

Possible NSLS-II Sources: 1. cryo STXM can be moved to an undulator beamline

at NSLS II

2. if there's sufficient demand, room temperature STXM could be moved to a soft-bend. However a

bending magnet source at NSLS-II is less bright than

X1, though one would not have to suffer the losses due

to beam-sharing and working off of an undulator peak.

#### **EXAFS**

Beamline: X18B and X19A

Managing Agents: NSLS

Synchrotron Catalysis Consortium

Energy Range: 4.9-40 keV

Techniques: EXAFS

% Subscription: 271% and 198% % GU Time: 25% (50% SCC)

Equivalent MES: 0.1

Planned Development: X19A has a planned upgrade for quick EXAFS

#### **EXAFS**

Beamline: X15B

Managing Agents: BNL Environ. Sciences/EnviroSuite

Energy Range: 2-5 keV, 0.8-10 keV

Techniques: EXAFS, XANES, grazing incidence XAS

% Subscription: 110%

% GU Time: 25% (PRT time is 90% Enviro-Geo Science)

Equivalent MES: 0.9

Other MES/LTG Support: NC State Soil Sciences, Skidaway Inst. Of

Oceanography

Planned Development: plans to upgrade to KB optics for µfocusing

#### X-Ray Diffraction

Beamline: X7B

Managing Agents: BNL, Chemistry Dept.

General Electric

Energy Range: 5-21 keV

Techniques: XRD, single crystal, time resolved

**WAXS** 

% Subscription: 276% % GU Time: 25% Equivalent MES: 0.18

Planned Development: Sagittal focusing bent Laue monochromator

With the current upgrades proposed, it's envisioned that X7B could potential transition to NSLS-II.

#### **FTIR**

Beamline: U10B Managing Agents: NSLS

Energy Range: 500-4000 cm<sup>-1</sup>

(50-600 cm<sup>-1</sup> on U10A)

Techniques: Infrared microspectroscopy

% Subscription: 136% % GU Time: 75% Equivalent MES: 0.15

Planned Development: Bruker Hyperion 3000 focal plane array detector

Beamline: U4IR Managing Agents: NSLS

Energy Range: 500-4000 cm<sup>-1</sup>

(50-600 cm<sup>-1</sup> on U10A)

Techniques: Infrared microspectroscopy

% Subscription: 136% % GU Time: 75% Equivalent MES: 0.15

Planned Development: Bruker Hyperion 3000 focal plane array detector

Both beamlines are planned for transition

Beamline	Techniques	Equivalent Earth/Enviro	Oversubscription Factor	Transitioned?
X26A	Microprobe	0.9	3.2	√
X27A	Microprobe	0.7	1.3	<b>√</b>
X1A	STXM	0.33	1.0	√ (as cryo-STXM)
X11A/B	EXAFS	0.45	1.8	
X18B	EXAFS	0.1	2.7	maybe
X19A	EXAFS	0.2	2.0	
X23A2	EXAFS	0.1	2.4	
X15B	EXAFS	0.9	1.1	√ (w/ upgrades)
X10C	EXAFS	0.1	0.7	
X7B	XRD	0.18	2.8	maybe
X16C	XRD	0.12	0.5	
X17B1/B2	High P	0.7	~ 2.0	Maybe (w/ SCW upgrade)
U2A	FTIR	1.0	1.0 (?)	$\checkmark$
U2B	FTIR	0.1	1.4	
U10B	FTIR	0.15	_1.4	$\checkmark$
		5.0	9.8 Beamlines Needed	